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(71) Applicant: MOTOROLA INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US).

(72) Inventors: ALLAND, Timothy, Kirk; 4506 Mill Pond Court, Colleyville, TX 76034 (US). HENZ, Christopher, G.; 1645 Summer Lane, Roanoke, TX 76262 (US).

(74) Agents: NICHOLS, Daniel, K. et al.; Motorola Inc., Intellectual Property Dept., 1500 Gateway Boulevard, MS96, Boynton Beach, FL 33462-8292 (US).

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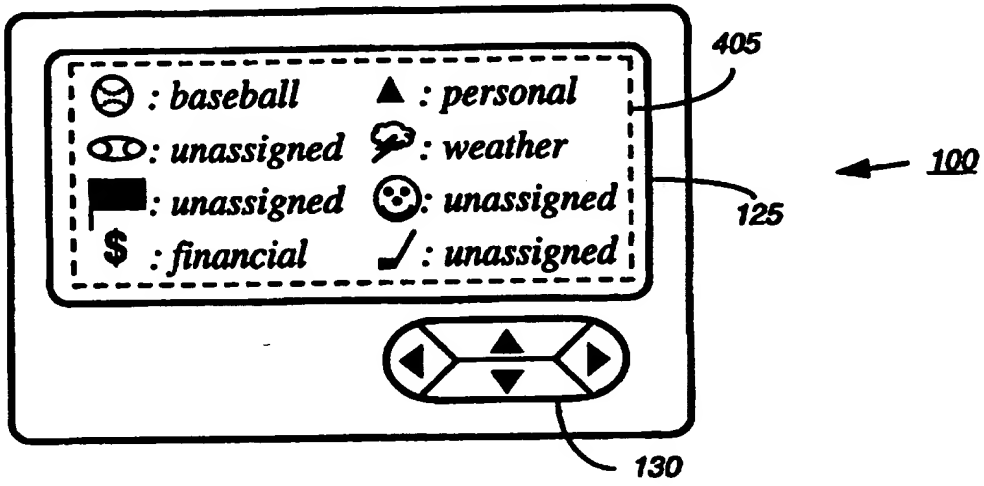

(57) Abstract

A communication device (100) for receiving and displaying information includes a memory (135) for storing messages of different message types, a database (140) for storing presentation information indicative of available icons, and a programming device (130) for receiving programming information indicative of which of the available icons are to represent which of the different message types. A display (125) presents, in accordance with the programming information, icons representative of the messages stored in the memory (135) and indicative of message types associated with the messages.

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METHOD AND APPARATUS FOR PROVIDING USER-PROGRAMMABLE ICONS IN A COMMUNICATION DEVICE

Field of the Invention

This invention relates in general to communication devices, and more specifically to a communication device that presents icons on a display.

Background of the Invention

Communication receivers, such as personal messaging devices, receive messages that are subsequently presented to a user. A user can subscribe to a variety of different message services and receive numerous message types. For instance, a personal messaging device can receive personal messages, maildrop messages, financial messages, sports messages, and any other type of message that is transmitted by a service to which the user can subscribe.

Conventional messaging devices often display icons to indicate to the user a number of received messages. When, for instance, five messages have been received and stored, five "message" icons appear on the display to inform the user of the five messages. However, in most prior art devices, icons used to represent different messages are identical in appearance. Even when different icons are presented to represent different message types, the number of different icons are very limited and usually convey little information regarding the types of messages with which they are associated.

Thus, what is needed is a method and apparatus for displaying icons that convey a greater amount of information about types of messages received by a communication device.

Brief Description of the Drawings

FIG. 1 is an electrical block diagram of a communication device for displaying icons in accordance with the present invention.

FIG. 2 illustrates the presentation of icons on a display included in the communication device of FIG. 1 in accordance with the present invention.

FIG. 3 illustrates the presentation of an icon and a related message on the display included in the communication device of FIG. 1 in accordance with the present invention.

FIG. 4 is a flowchart of an operation of a presenter included in the communication device of FIG. 1 in accordance with the present invention.

FIG. 5 is a flowchart of an operation of a programmer included in the communication device of FIG. 1 in accordance with the present invention.

FIGs. 6 and 7 depict the presentation of programming screens on the display included in the communication device of FIG. 1 in accordance with the present invention.

Description of a Preferred Embodiment

FIG. 1 is an electrical block diagram of a communication device 100, such as a personal messaging device or portable transceiver, including a receiver 105 for receiving a signal and a decoder 110 coupled to the receiver 105 for decoding different types of messages from the signal. The types of messages received by the communication device 100 can be, for instance, related to different message sources, e.g., different services to which the user subscribes. By way of example, when the user subscribes to a news service, a weather service, and a sports service, types of messages would include news messages, weather messages, and sports messages. Personal messages could be received as well. Message types could also relate to message priorities, e.g., high priority, or urgent, and low priority, or message subject categories, e.g., business or personal.

The communication device 100 further comprises a controller 115 for controlling operations of the device 100, an alert device 120 for generating an alert to announce message reception, a display 125 for presenting information, and a programming device for receiving programming information. The programming device can be, for instance, controls 130 that are accessible to the user for receiving user inputs, a data port for

receiving programming information via another device, or a radio receiver for receiving over-the-air programming signals.

A message memory 135 is coupled to the controller 115 for storing received messages and for storing the types of the received messages. Other information, such as reception time and whether or not the message has been read by the user, could also be stored. An icon database 140 preferably stores presentation information associated with available icons, e.g., icons that are capable of being presented on the display 125. Additionally, the icon database 140 stores information by which the different message types are associated with different icons in accordance with the received programming information.

Further included in the communication device 100 is a device memory 145 for storing type information used to identify the different types of messages that can be received. The type information could, for example, comprise different addresses, channel frequencies, codes, or signal information that is associated with the different types of messages. For instance, local weather messages could be received on a first address, while sports messages could be received on a second address. A presenter 155 included in the communication device 100 drives the display 125 to present icons that represent received messages and that indicate message type, and a programmer 150 programs the icon database 140 in accordance with the programming information provided by the user via the programming device. In accordance with a preferred embodiment of the present invention, the presenter 155 and the programmer 150 comprise firmware elements that are stored in the device memory 145 and executed by the controller 115. Alternatively, the presenter 155 and the programmer 150 could be implemented in hardware capable of performing equivalent operations.

According to the present invention, the user of the communication device 100 can conveniently customize icons to represent different types of messages. This can be done by permitting the user to select icons from among the available icons capable of presentation and to designate which message type each selected icon is to represent. For instance, the user could choose a football icon to represent sports messages, a lightning bolt icon to represent weather messages, and a house icon to represent personal messages. In this manner, the user is presented with icons having meanings that can be quickly and easily discerned by the user. As a result,

situations are avoided in which the user is faced with displayed information that is meaningless to him.

FIG. 2 illustrates an example of a default screen that can be presented on the display 125. As shown, the communication device 100 could visually present a row of icons across the top line of the display 125 to represent messages that have been received and stored in the message memory 135. The display of a baseball icon 160, a cloud-and-lightning bolt icon 165, and a dollar sign icon 170 could indicate that a baseball message, a weather message, and a financial message have been received. The triangular icons 175 could have been assigned by the user to represent another type of message, e.g., personal messages. Alternatively, the triangular icons 175 could be default icons that represent message types for which the user has not yet assigned any particular icons.

Referring next to FIG. 3, an example of presentation of a message on the display 125 is depicted. When the user has chosen to display a weather message, for example, the icon 165 associated with the weather message could be displayed along with the message itself. In this manner, the user can conveniently determine message type on the first displayed screen of the message. This is especially useful when the message is too long for display on a single screen and the message type is not evident from the first few words of the message.

In prior art communication devices, unlike the communication device 100, icons representative of messages are usually identical regardless of message type. Even when message icons are not identical, the number of available icons is very limited, and the user has no control over the meaning of the displayed icons. As a result, icons displayed by conventional devices can be meaningless to a user unless he has access to the device manual. Conversely, the user of the communication device 100 according to the present invention can assign icons with different appearances to different message types. As a result, each assigned icon is likely to be recognized by the user without much effort. Furthermore, because icons can be assigned by the user and because the device 100 can be programmed via the programming device, e.g., the controls 130, the user could download different or additional icons for storage in the icon database 140 as available icons, thereby permitting a greater range of icon customization.

FIG. 4 is a flowchart of an operation of the presenter 155 (FIG. 1). When, at step 205, a display command is received from the controls 130, the message memory 135 and the icon database 140 are referenced, at step 210. The selected message and the icon representative of the message type are then retrieved, at step 215, and presented on the display 125, at step 220, so that the user can read the message and discern the message type.

When, at steps 205, 225, the user has not chosen to read a particular message but messages are currently stored in the message memory 135, the message memory 135 and the icon database 140 are referenced, at step 230. For each stored message, the assigned icon indicative of its type is retrieved, at step 235, and displayed, at step 240.

It will be appreciated that the display screens described above in reference to the presenter 155 are examples of many screens that could be displayed on the display 125. Different screens, additional screens, and different arrangements or uses of the programmed icons could also be displayed by the presenter 155 in accordance with the present invention. By way of example, the presenter 155 could drive the display 125 to present icons representative of read or unread messages and indicative of the types of the messages.

Referring to FIGs. 5-7, an example of a programming process is illustrated. FIG. 5 is a flowchart depicting an operation of the programmer 150. FIGs. 6 and 7 illustrate programming screens that can be displayed to facilitate the programming of the icon database 140. When, at step 305 (FIG. 5), a program command is received, the icon database 140 is referenced, at step 310. Preferably, the display 125 is then driven, at step 315, to present an initial icon programming screen 405 (FIG. 6) on which all of the available icons are presented. Additionally, the icon programming screen 405 could show icon assignments that have been previously made by the user. It will be recognized that more than one icon programming screen 405 could be presented when the number of available icons is too great to permit presentation of all available icons at one time.

When, at step 320 (FIG. 5), one of the displayed icons has been selected by the user, such as through control signals provided via the controls 130, a type programming screen 410 (FIG. 7) is preferably presented on the display 125, at step 325 (FIG. 5). The type programming screen 410 could include, for instance, a presentation of the icon highlighted by the user and a list of the different message types that can be received by the

communication device 100. When, at step 330, a message type is selected, the icon database 140 is updated, at step 335, to associate the selected icon with the selected message type. Unless a control signal is received, at step 340, to indicate that programming is complete, the icon programming screen 405 is again displayed, at step 315, to allow the user to enter further programming information.

In summary, the communication device as described above receives messages of different types and stores information associated with a number of icons that are able to be presented to a user of the communication device. According to the present invention, the user can program the communication device to customize the icons by assigning icons to the different message types. Therefore, presentation of the assigned icons conveys information about message type to the user. Because the user himself has programmed the icon assignments, he is likely to remember the meanings of the different icons without having to consult a list or a manual.

It will be appreciated by now that there has been provided a method and apparatus for displaying icons that convey a greater amount of information about types of messages received by a communication device.

What is claimed is:

CLAIMS

1. A communication device for receiving different types of messages, the communication device comprising:

a memory for storing messages received by the communication device;

a database for storing available icons;

a programming device coupled to the database for receiving programming information indicative of which of the available icons are to represent which of the different types of messages; and

a display coupled to the memory and the database for presenting, in accordance with the programming information, icons representative of the messages stored in the memory and indicative of message types associated with the messages.

2. The communication device of claim 1, further comprising:

a programmer coupled to the programming device and the database for programming the database in accordance with the programming information.

3. The communication device of claim 1, wherein the different types of messages are associated, respectively, with different message sources.

4. The communication device of claim 1, wherein the different types of messages are associated with services to which a user of the communication device subscribes.

5. The communication device of claim 1, further comprising:

a presenter coupled to the display for driving the display with the icons in accordance with the programming information.

6. The communication device of claim 1, further comprising:

a receiver for receiving a signal;

a decoder coupled to the receiver for decoding the messages from the signal; and

an alert device coupled to the decoder for generating an alert to announce reception of the messages.

7. The communication device of claim 1, wherein the programming device comprises controls accessible to a user of the communication device.

8. A personal messaging device for receiving and displaying different types of messages, the personal messaging device comprising:

a receiver for receiving messages;

a message memory coupled to the receiver for storing the messages;

a device memory for storing type information indicative of the different types of messages that can be received;

a database for storing available icons;

a programming device coupled to the database and the device memory for receiving programming information indicative of which of the available icons are to represent which of the different types of messages; and

a display coupled to the message memory and the database for presenting, in accordance with the programming information, icons representative of the messages stored in the message memory and indicative of message types associated with the messages.

9. The personal messaging device of claim 8, further comprising:

a programmer coupled to the programming device and the database for programming the database in accordance with the programming information.

10. The personal messaging device of claim 8, wherein the different types of messages are associated, respectively, with different message sources.

11. The personal messaging device of claim 8, wherein the different types of messages are associated with services to which a user of the personal messaging device subscribes.

12. The personal messaging device of claim 8, further comprising:

a presenter coupled to the display for driving the display with the icons in accordance with the programming information.

13. The personal messaging device of claim 8, wherein the programming device comprises controls accessible to a user of the personal messaging device.

14. A method for displaying information received by a communication device that has a memory, a display, and a programming device, the method comprising the steps of:

storing available icons that can be presented on the display and type information indicative of different types of messages that can be received;

receiving messages;

receiving programming information indicative of which of the available icons are to represent which of the different types of messages; and

presenting, in accordance with the programming information, icons representative of the messages that have been received and indicative of message types associated with the messages.

15. The method of claim 14, wherein the presenting step comprises the step of:

displaying, in accordance with the programming information, the icons representative of the messages, wherein the icons indicate message sources of the messages.

16. The method of claim 14, wherein the presenting step comprises the step of:

displaying, in accordance with the programming information, the icons representative of the messages, wherein the icons indicate services to which a user of the communication device subscribes.

17. The method of claim 14, further comprising the step of:

programming, responsive to the step of receiving the programming information, the programming information into a database for storing the available icons.

18. The method of claim 14, wherein the presenting step comprises the step of:

driving the display with the icons in accordance with the programming information.

19. The method of claim 14, further comprising the steps of:

decoding, prior to the step of receiving the messages, the messages from a signal;

storing the messages; and

generating an alert to announce reception of the messages.

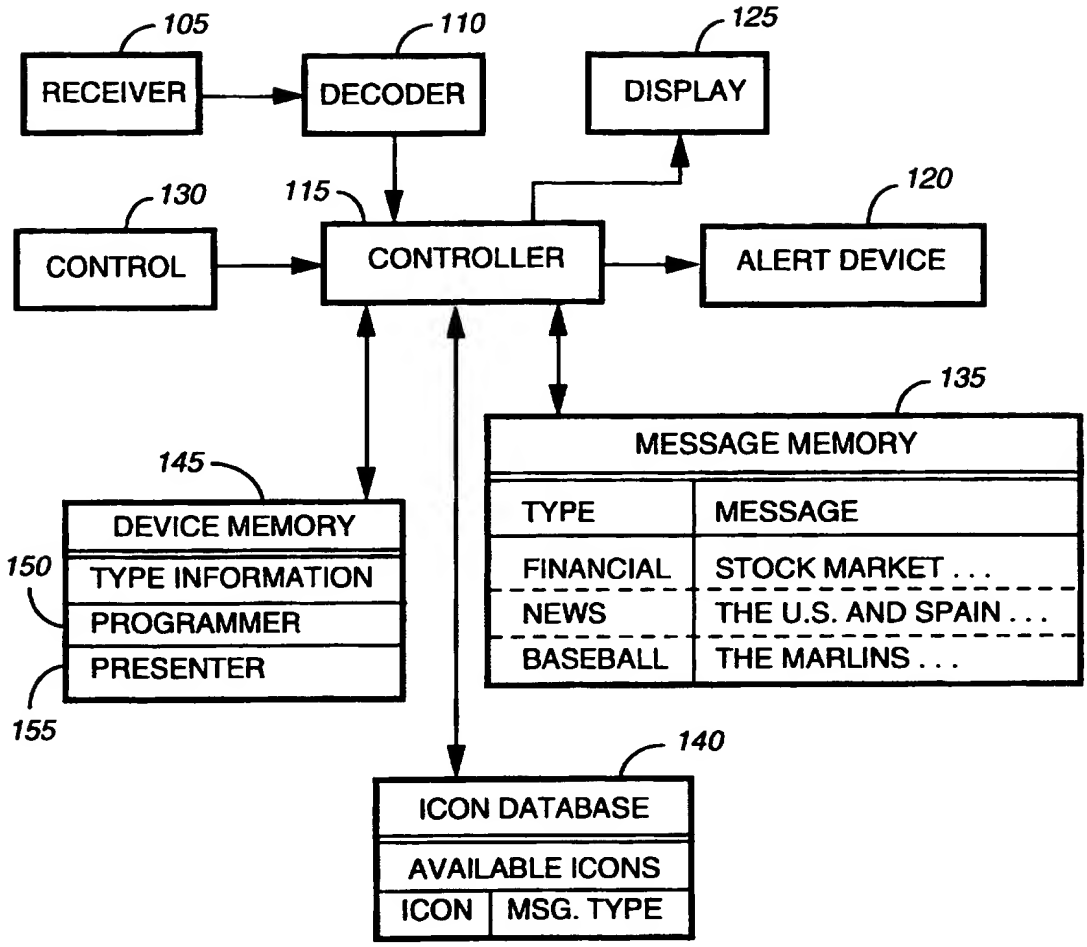
105
RECEIVER
110
DECODER
125
DISPLAY
130
CONTROL
115
CONTROLLER
120
ALERT DEVICE
135
MESSAGE MEMORY
TYPE
MESSAGE
FINANCIAL
STOCK MARKET . . .
NEWS
THE U.S. AND SPAIN . . .
BASEBALL
THE MARLINS . . .
145
DEVICE MEMORY
150
TYPE INFORMATION
PROGRAMMER
PRESENTER
155
140
ICON DATABASE
AVAILABLE ICONS
ICON
MSG. TYPE
100

FIG. 1

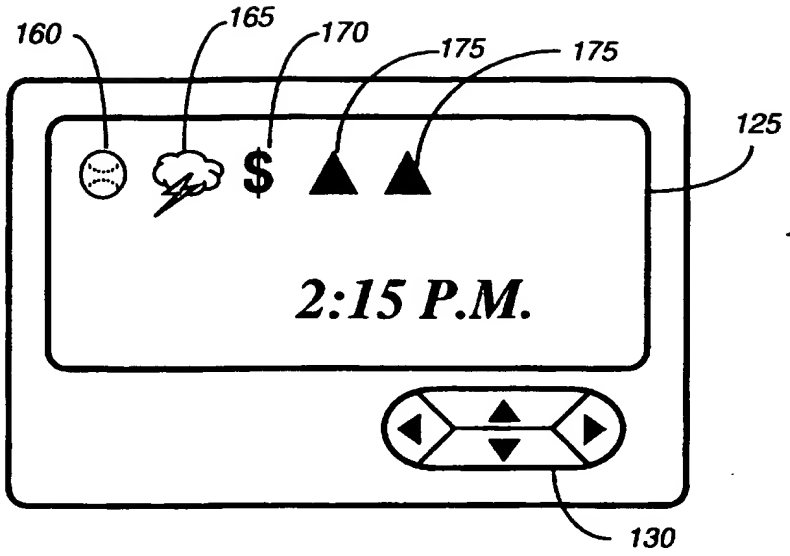
160
165
170
175
175
125
$
2:15 P.M.
100
130

FIG. 2

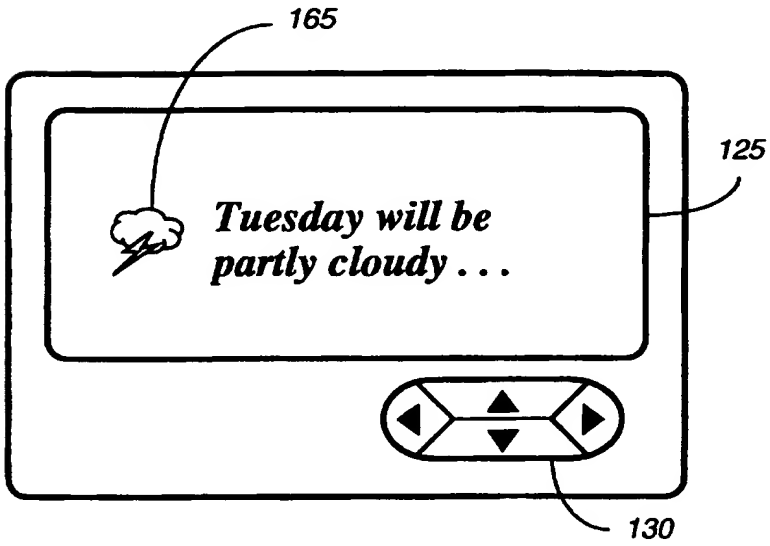
165
125
Tuesday will be
partly cloudy . . .
100
130

FIG. 3

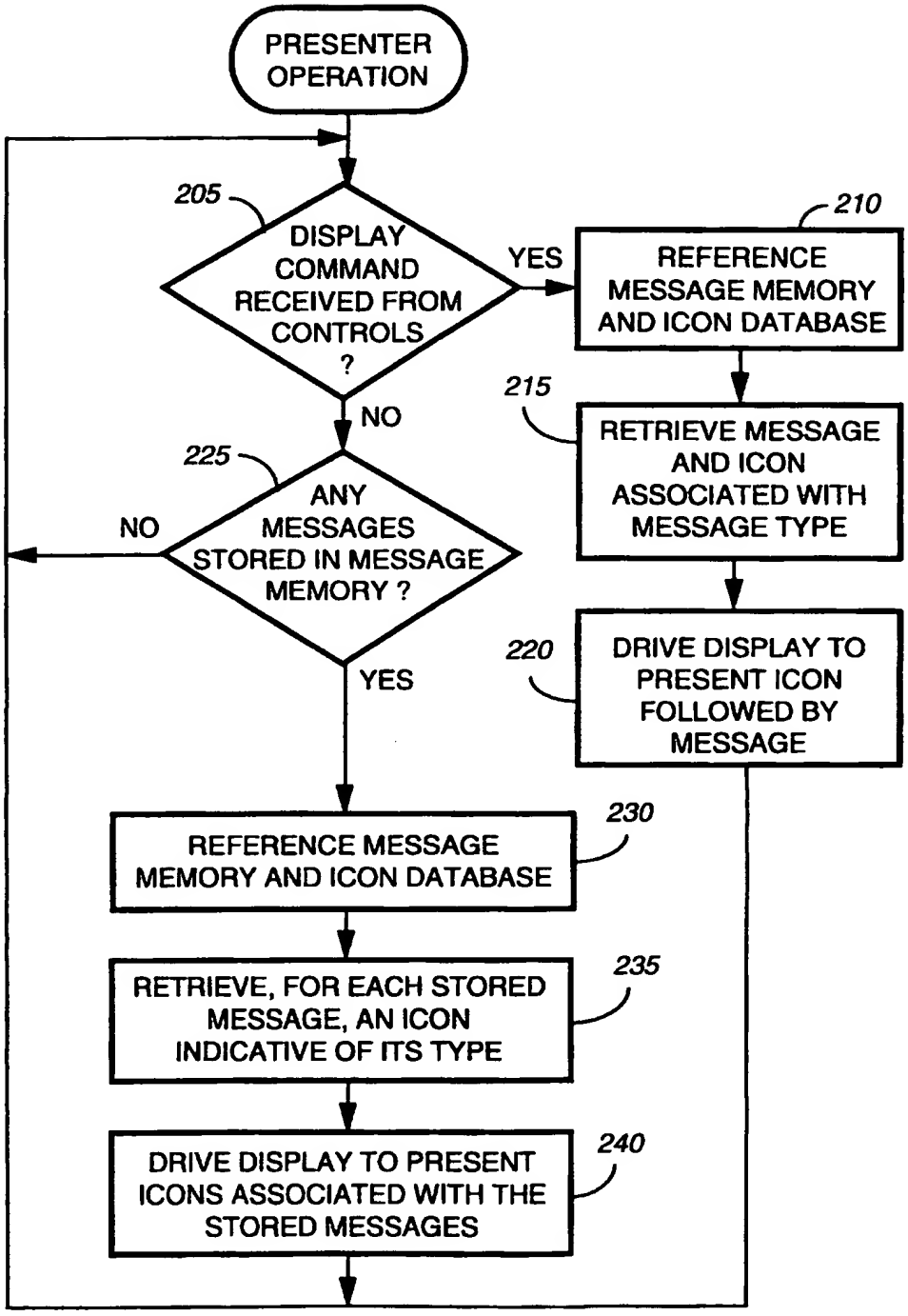
PRESENTER OPERATION
205
DISPLAY COMMAND RECEIVED FROM CONTROLS ?
YES
210
REFERENCE MESSAGE MEMORY AND ICON DATABASE
NO
215
RETRIEVE MESSAGE AND ICON ASSOCIATED WITH MESSAGE TYPE
225
ANY MESSAGES STORED IN MESSAGE MEMORY ?
NO
YES
220
DRIVE DISPLAY TO PRESENT ICON FOLLOWED BY MESSAGE
230
REFERENCE MESSAGE MEMORY AND ICON DATABASE
235
RETRIEVE, FOR EACH STORED MESSAGE, AN ICON INDICATIVE OF ITS TYPE
240
DRIVE DISPLAY TO PRESENT ICONS ASSOCIATED WITH THE STORED MESSAGES

FIG. 4

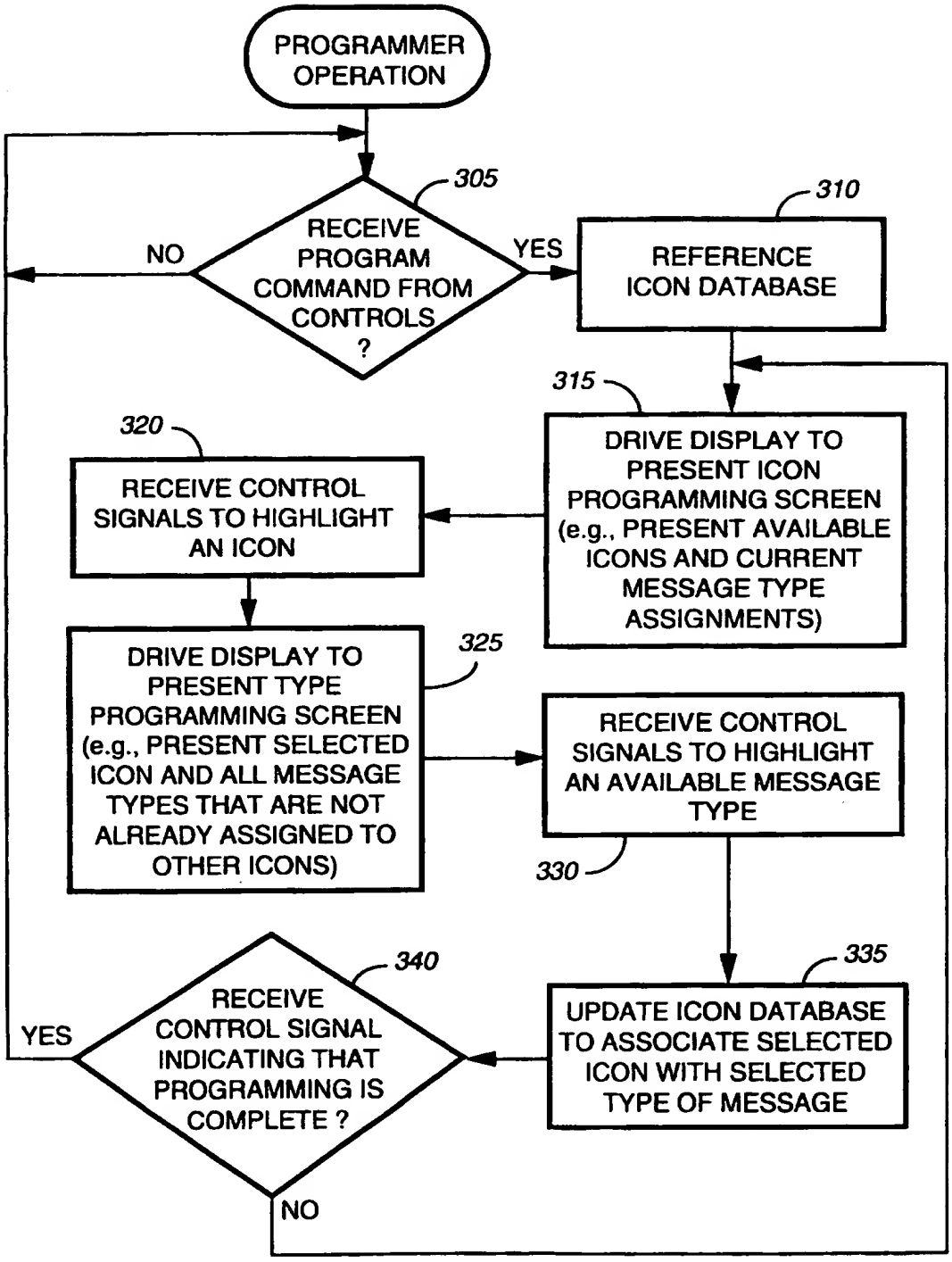
PROGRAMMER OPERATION
305
RECEIVE PROGRAM COMMAND FROM CONTROLS ?
NO
YES
310
REFERENCE ICON DATABASE
315
DRIVE DISPLAY TO PRESENT ICON PROGRAMMING SCREEN (e.g., PRESENT AVAILABLE ICONS AND CURRENT MESSAGE TYPE ASSIGNMENTS)
320
RECEIVE CONTROL SIGNALS TO HIGHLIGHT AN ICON
DRIVE DISPLAY TO PRESENT TYPE PROGRAMMING SCREEN (e.g., PRESENT SELECTED ICON AND ALL MESSAGE TYPES THAT ARE NOT ALREADY ASSIGNED TO OTHER ICONS)
325
RECEIVE CONTROL SIGNALS TO HIGHLIGHT AN AVAILABLE MESSAGE TYPE
330
335
UPDATE ICON DATABASE TO ASSOCIATE SELECTED ICON WITH SELECTED TYPE OF MESSAGE
340
RECEIVE CONTROL SIGNAL INDICATING THAT PROGRAMMING IS COMPLETE ?
YES
NO

FIG. 5

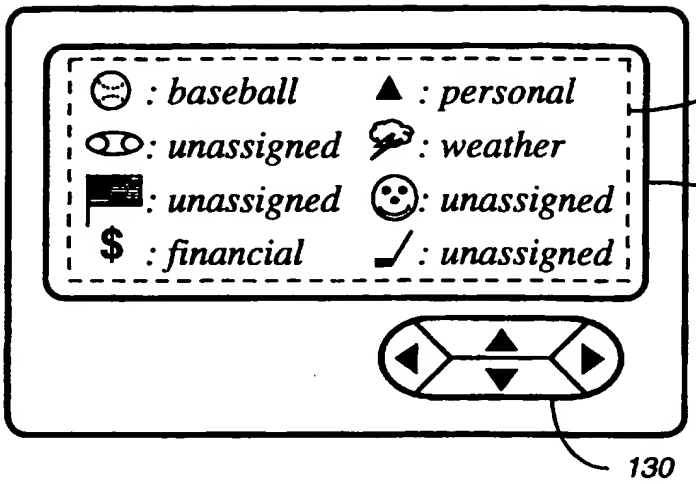
: baseball
: personal
: unassigned
: weather
: unassigned
: unassigned
$: financial
: unassigned
405
125
100
130

FIG. 6

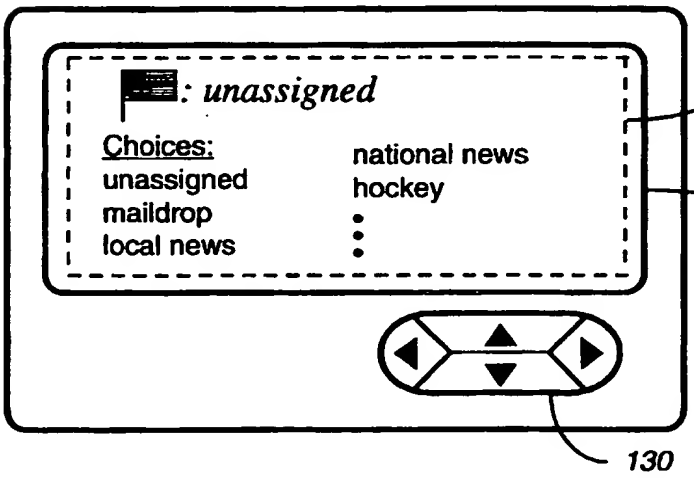
: unassigned
Choices:
unassigned
maildrop
local news
national news
hockey
405
125
100
130

FIG. 7